Selected Publications on the Value of Graduate Education in the Military

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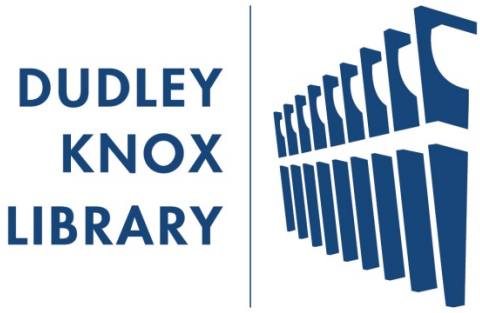
Monterey, California: Naval Postgraduate School



NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

Selected Publications on the Value of Graduate Education in the Military

Compiled by

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December, 2017

Available at https://calhoun.nps.edu/handle/10945/56497

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ABSTRACT

This document presents a sampling of unclassified, unlimited distribution (public release) graduate theses and dissertations, reports, journal articles, and conference papers produced between 1997 and 2017 on the topic of the value of a graduate education in the military context. It focuses on research by NPS authors, but includes a selective list of publications by authors not affiliated with NPS.

Citations for publications about the value of an NPS or other military graduate education were retrieved using a variety of search strategies. Sources included the NPS Archive: Calhoun, (https://calhoun.nps.edu), the Defense Technical Information Center (DTIC) Technical Reports Collection (http://www.dtic.mil/dtic/search/advanced_search.html), and various journal article databases. Unless otherwise noted, abstracts were retrieved from Calhoun.

Citations for each document type (theses, dissertations, faculty publications, non-NPS publications) are presented in reverse chronological order.

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NPS THESES

In progress: Pitzler, Benjamin. A study of retention and performance of naval officers with funded graduate education. (expected graduation date Dec. 2017)

Fowler, K.M. (2017). *A study on factors affecting Navy officers' decisions to pursue funded graduate education: A qualitative approach.* Retrieved from http://hdl.handle.net/10945/55597

This thesis examines if adjusting the service obligation for officers who pursue advanced-level degrees has the potential to increase returns to investment from Navy-funded graduate education. Using a qualitative approach of focus groups and one-on-one interviews with thirty-five Naval Postgraduate School (NPS) resident students, this thesis aims to identify the primary factors Navy officers consider when deciding to attend fully funded graduate education at NPS, how these factors vary by communities and years of commissioned service, and how the decision to attend NPS might be impacted by a change in service requirements. The depth of answers from the study participants provides valuable feedback about officers' perceptions of value and costs related to Navy-funded graduate education and highlights the differences in these perceptions among officer communities. As a result of the study, it is recommended that the Navy not add more than six months of service obligation, as doing so may have a negative effect on an officer's decision to accept a graduate education opportunity and, as a result, the decision to retain. The findings can be used by policymakers to make more informed decisions on how to fund and obligate service members who choose fully funded graduate education.

Reteike, C.N. (2017). *Quantitative analysis of high-quality officer selection by commandant's career-level education board.* Retrieved from http://hdl.handle.net/10945/53036

As the Marine Corps seeks to recruit and retain high-quality individuals, the term quality must be defined in order to meet current and future manpower needs. In our research, we identify characteristics and attributes valued by the Marine Corps when selecting high-quality company-grade officers. Selection on Commandant's Career-Level Education Board (CCLEB) serves as a proxy for high quality. Our research finds that factors relating to job experience and job performance are valued more highly than variables associated with training or early career attributes of Marines during the CCLEB selection process. The board places substantial emphasis on job performance, as measured by fitness report value, when selecting Marines for CCLEB. This finding is in line with the intent and goal of the Fitness Report (FITREP) system of identifying high-quality personnel. Seniority, as measured by years of commissioned service, also appears to be a strong predictor of selection outcome. The presence of an updated photograph in a Marine's Official Military Personnel File (OMPF), which can be interpreted as a signal of motivation or ability to follow instructions, shows a significant effect on selection. In addition, our results show The Basic School (TBS) scores, specifically the academic and leadership portions, are an accurate earlier predictor of both performance and selection. The findings in this study provide support in the effort of identifying and measuring the quality of Marine Corps officers.

Rosenthal, M. (2017). *Comparing the NPS MBA resident and distance learning programs*. Retrieved from http://hdl.handle.net/10945/55527

Distance learning (DL) instructional modes are of interest to the Naval Postgraduate School (NPS) as the school provides access to graduate education for officers posted at remote duty stations. However, studies report mixed academic achievement for general DL versus resident students, with similarly mixed findings for students pursuing Master of Business Administration (MBA) degrees. Two 2016 studies evaluating NPS programs overall report lower completion rates for DL versus resident students. This MBA project was conducted to help find similarities and/or differences in four evaluation areas: entry requirement Academic Profile Codes (APC), grade point averages (GPA), graduation status, and student survey responses on perceptions of program experience. Data analyses were performed without controlling for student, course, or program-specific factors to suggest general areas for a more in-depth study. Project findings show little or no between-group differences in GPA, but DL MBA students were less likely to graduate than resident peers, who also had greater success in most math-intensive courses. These findings may support further studies of factors that may affect student success within DL versus resident programs.

Veenhuis, C.B. (2017). *Comparative research of Navy Voluntary Education at operational commands*. Retrieved from http://hdl.handle.net/10945/52947

This research analyzes the enrollment growth of the Tuition Assistance (TA) program and the continued decline in enrollment within the Navy College Program for Afloat College Education (NCPACE). NCPACE has provided higher education with alternatives to traditional methods of instruction for Sailors and Marines for over four decades. TA and NCPACE utilize two primary methods of instruction: distance learning (DL) and traditional instructor-led (IL) for their college educations. The research shows overall NCPACE

enrollments have been declining since 2000. Between fiscal year (FY) 2011 and FY2015, NCPACE experienced an overall annual percentage decrease of 8%. During the same period, TA experienced an overall annual percentage increase of 2%. The primary method of instruction has been shifting in the last decade. FY2014 was the first time NCPACE enrollees preferred DL to IL. The research shows the declining trend in IL course enrollment combined with a more tech-savvy generation joining the Navy requires serious thought to how the Navy Volunteer Education (VOLED) system will shift to the changing dynamic. The conclusion of this research provides insights on the current and future dynamic involved with VOLED in the Navy and is contrary to the accepted perceptions of traditional educational paradigms and the types of learner the system intends to attract.

Clark, E.S. (2016). *The effect of graduate education timing on the retention of surface warfare officers*. Retrieved from http://hdl.handle.net/10945/48505

This thesis examines the effect of the timing of graduation education attainment on retention of officers within the Surface Warfare community. Navy Surface Warfare Officers (SWOs) commissioned between fiscal years 1999 and 2003 were classified as having no graduate degree, or earning their master's prior to service, before five years of service, between five and 10 years of service, and after 10 years of service. Differential bivariate probit analysis is used to determine the effect of the timing of graduated education attainment on retention to the tenth, eleventh, and twelfth year of service as well as promotion to O-4. The findings show that SWO Department Heads who earn a master's degree at any point within their careers are more likely to retain. Officers who earned a graduate degree before commissioning or prior to five years of commissioned service are no more likely to retain,

as compared with SWOs with no graduate education, while whose who obtained graduate education after five years of service are significantly more likely to retain. In addition, the findings show that Department Heads earning a master's degree at any point within their careers are more likely to promote to O-4, compared with those who had not earned a master's degree. Graduate education shows to have the potential of a strategic investment in human capital that can be used by the Navy as a retention tool. Future work can address the potential selection bias associated with higher retention of those with graduate education attained after five years of commissioned service by SWOs who might be already committed to a Navy career.

Fodor, J.N. (2016). *Distance learning: The impact of not being a resident student.* Retrieved from http://hdl.handle.net/10945/48521

The existing literature suggests there are no significant outcome differences between online and traditional degree programs in the civilian sector. Few studies have looked for such differences within military schools and colleges, specifically. Given the growing popularity of online and distance education degree programs, we study the impact of this particular mode of instructional delivery on the academic and subsequent job performance of military officer students enrolled at the Naval Postgraduate School (NPS). Using propensity score matching, we estimate the effects that being a distance learning (DL) student has on four performance outcomes: grade point average, graduation, promotion, and separation. We further subdivide the sample into various subgroups based on military service branch, warfare community, academic preparation, and school within NPS to determine the heterogeneous effects of DL within each subsample. The DL students studied performed

significantly worse than equivalent resident students on every measurement. We found NPS students enrolled in DL degree programs obtain GPAs approximately half a letter grade lower, are less likely to graduate, are less likely to promote, and are more likely to separate from military service than their NPS resident student counterparts. Given these results, it is imperative to conduct additional research to ascertain what makes distance learning inferior to residency at the Naval Postgraduate School.

Maugeri, W.V. (2016). *The effect of STEM degrees on the performance and retention of junior officers in the U.S. Navy.* Retrieved from http://hdl.handle.net/10945/48560

The Navy has long operated under the Rickover hypothesis, stressing the importance of recruiting and retaining Science Technology Mathematics and Engineering (STEM) background officers to man the increasingly technologically advanced weapon systems. This thesis tests the validity of this hypothesis by analyzing the performance and retention of junior officers with STEM degrees, compared with that of junior officers with non-STEM degrees. Additionally, this thesis examines the effects of college selectivity, commissioning source and various demographics on performance and retention. While previous research on the effects of STEM degrees on junior officer performance and retention have been largely inconclusive, this thesis's findings show that a STEM degree has positive and significant effects on retention and on promotion to O-4, and a negative effect on Fitness Report performance. Further research can be done to examine which STEM majors are most likely to succeed, and how lateral transfer opportunities impact STEM officer performance and retention.

Ealy, Daniel A. (2015). *Utilization of graduate education in the United States Marine Corps.* Retrieved from http://hdl.handle.net/10945/45182

This research was conducted at the request of Marine Corps University and examined the utilization of 344 graduate education billets within the Marine Corps. The research findings make two recommendations: 1) DC CD&I should charter a working group and use this research as a basis to review the reallocation of under-utilized BEEC BMOSs. 2) DC CD&I should also review BEEC BMOS structure and consider a new distribution plan that includes a new graduate education requirements assessment. These billets are highly desired by units due to their excepted manning precedence level. This thesis used survey methods to collect utilization data on Marine Corps Officers that graduated from the Special Education Program and the Advanced Degree Program between the years of 2009 and 2013. The survey is approved through the Naval Postgraduate School Institutional Review Board (NPS IRB), sponsored through Training and Education Command (TECOM) and supported by Headquarters Marine Corps(HQMC). The data collected from the survey was analyzed to identify significant factors that are highly correlated with low and high utilization in order to improve efficiencies. Findings include initial placement rate from school to billet of 93 percent and the utilization rate reflecting self-reported usage while in billet of 75 percent, identified throughout individual tours. This difference between placement utilization reflects the disparity between top-down and bottom-up planning. Collective review and reorganization of these billets is recommended to reduce further disparity between placement and utilization rates. Objective evaluation and fair reorganization based upon

high utilization will ensure Marine Corps human resource assets remain a constant force multiplier and act as a model for high retention strategy.

Cheek, S.W. (2013). *Retention effects of immediate graduate education in the nuclear community*. Retrieved from http://hdl.handle.net/10945/34643

This thesis examines how the timing of graduate education affects retention among officers in the nuclear community. Officers were divided into four main categories: Earned a master's degree in the first five years of their career, earned a masters after five years of their career, never earned a masters, and commissioned with a masters. The retention behavior of officers in each of these categories was compared to determine the effect on an officers decision to remain in the Navy until promoted to CDR. Officers who earned their graduate degree in the first five years of their career had a positive effect on retention given the officer had attained the rank of Lieutenant Commander or had at least been commissioned in the nuclear community for ten years. The cost to send an officer to graduate school in the first five years is substantially less than sending him later in his career. The scholarship programs that send officers to graduate school early in their career make a substantial contribution to the nuclear community and should be utilized as a cost effective tool for all officers to earn their graduate degree before their Executive Officer sea tour.

Dexter, R.M. (2013). *United States Special Operations command professional military education.* Retrieved from http://hdl.handle.net/10945/38915

The United States Special Operations Command does not have an intermediate-level

professional military education program for its officers. Current service-provided PME programs are not adequately meeting the educational goals for officers as required by USSOCOM. Through the Joint Special Operations University, SOCOM could establish its own PME program for officers of all services who are assigned to USSOCOM. Through the review of formal documents and interviews with senior officers in USSOCOM, an education gap was identified and analyzed. Three courses of action are presented as to how USSOCOM can overcome this education gap and meet Admiral William H. McRavens intent to have the best educated force in the United States military.

Abunaz, E. & Torun, B. (2012). *The effect of advanced education on the retention and the promotion of surface warfare officers in the U.S. Navy*. Retrieved from http://hdl.handle.net/10945/6758

The goal of this thesis is to analyze the effect of advanced education on the retention and promotion of Navy Surface Warfare Officers (SWO). Multivariate probit models are used to estimate the effects of education, accession sources, demographic variables, and prior service status on retention and promotion. The data set used in this study is obtained from the online Navy Econometric Modeling System (NEMS). It was constructed from annual snapshots of SWO officers in the Navy between 2000 and 2011. The data set includes 73,347 officer-year observations on 14,422 officers. We create cohorts based on the entry years of the officers and track their retention between the end of their initial service obligation (four or five years), until the end of their tenth year of service. For the promotion analysis, we analyzed promotion to O-4 by the tenth year of service. The retention analysis finds that Master's degree holders and First Professional degree holders are more likely to

remain in the Navy until ten years of service as compared to Baccalaureate degree holders. The promotion analysis also finds that only Master's degree holders are more likely to be promoted compared to Baccalaureate degree holders.

Louidor, D. (2012). *Evaluation of graduate education policy in the U.S. Navy.* Retrieved from http://hdl.handle.net/10945/7377

This thesis evaluates Navy policy by comparing elements of fully-funded and partially-funded Graduate Education Programs (GEPs). The Navy's primary goal in offering funded graduate education is to support requirements for officers with specific subspecialty skills. Officers are considered funded if they attend graduate school full time for 26 or more weeks, regardless of whether the degree program is partially- or fully-funded. For a fully-funded program, the Navy provides full pay and allowances for the duration of the course of study plus all tuition costs. For a partially-funded program, the Navy generally provides only pay and allowances, and the individual or an organization other than the Navy pays the tuition. Particular attention was given to researching DoD and Navy policies, a review of stakeholders responsibilities, and management of the Navy's GEP. The results identify gaps in the current policy directive (OPNAVINST 1520.23B), which had not been updated in over twenty years. The study proposes policy and program changes to better manage and more effectively execute graduate education in the U.S. Navy. From an equity perspective, the partially-funded service obligation needs revision to reflect its actual burden to the individual officer and the Navy. It is further recommended that the Navy review its existing graduate education instructions to confirm that language is current and meets officers career milestone objectives.

Pate, B.C. (2012). *A qualitative analysis of Navy funded graduate education in meeting HR subspecialty billet knowledge requirements.* Retrieved from http://hdl.handle.net/10945/6850

This research examines how effectively the Navy is meeting its goal of preparing HR officers with the necessary education to meet the demands of subspecialty (SSP) coded billets through its resident funded graduate education programs at Naval Postgraduate School (NPS). A comparative mapping analysis is used to determine the degree of likeness between billet knowledge requirements, represented by Navy Officer Billet Classifications (NOBCs), and Education Skill Requirements (ESRs) that form the basis of these graduate curricula. A December 2011 data set was used to examine all 3111, 3130, 3211, 4600, and 6201-coded HR billets that are sourced by resident funded graduate education (Financial Management, Manpower Systems Analysis, Operations Analysis, Human Systems Integration, and Information Systems and Technology respectively). The research concludes that the Navy is effectively achieving its educational goal for HR officers attending NPS. Recommendations include continued billet management and an in-depth needs analysis by activity in lieu of NOBC mapping, to maintain and address emerging requirements in the fleet.

Dyer, R.B. and Pierce, R.D. (2011). *Cost benefit analysis of MARSOC marines in the Naval Postgraduate School Defense Analysis.* MBA Professional Report. Retrieved from http://hdl.handle.net/10945/10595

The United States Marine Corps does not have a specific professional military education program for Special Forces. Furthermore, it does not send any of its officers or NCOs to the

Naval Postgraduate School to attain a Master's Degree in Defense Analysis. Studies completed in sister services have shown this program to be invaluable to its future staff officers. This project will conduct a cost-benefit analysis of the United States Marine Corps sending Marine Special Forces Officers through a dedicated training pipeline, and more specifically the Naval Postgraduate School Defense Analysis Programs (Irregular Warfare, Information Operations, Terrorist Operations and Financing). This thesis will aid the Marine Corps in determining the costs and benefits (with dollar amount) of sending its officers through the Naval Postgraduate School's DA Program.

Park, S.C. (2011). *Effectiveness of voluntary education in operational environments: an analysis of the Navy college program for afloat college education (NCPACE)*. Retrieved from http://hdl.handle.net/10945/5801

The Navy College Program for Afloat College Education (NCPACE) is one of the main components of the United States Navy's Voluntary Education (VOLED) program, offering college courses and remedial academic skill modules to sailors on sea duty or stationed in remote locations. This thesis predicts the likelihood of NCPACE course completion by course and individual participant characteristics using a logistic regression model. We found that participants who take distance learning-based and mathematics courses have lower predicted odds of succeeding, while participants with higher Armed Forces Qualification Test (AFQT) scores and levels of education have higher predicted odds of succeeding. Some variation was noticed between unit vessel types and school. This thesis also evaluates the likelihood of attempting and successfully completing a subsequent course conditional on the outcome of the first course. Successful completion of the first course is positively associated

with an enrollment in a subsequent course in addition to the successfully completion of that course. Lastly, this thesis examines promotion, extension and reenlistment outcomes for first-term NCPACE participants with 48-month contracts. We found that those who successfully completed at least one course are predicted to be more likely to promote to E5 and are predicted to be slightly less likely to reenlist in the Navy.

Burris, B.M. (2010). *Army special operations forces professional military education for the future*. Retrieved from http://hdl.handle.net/10945/5295

One way to educate United States Army Special Operators is by allowing organizational design and individual competencies to form the nucleus of a professional military education curriculum routinely evaluated against assessment variables such as the emerging strategic context, the requests of Theater Special Operations Commands or other customer units, and the feedback of deployed operators and teams. This thesis recommends an Army Special Operations Command-focused educational development process applicable to the career-long education and utilization of Special Forces, Civil Affairs, and Psychological Operations professionals. To make these recommendations, the thesis considers why the organizational structure of the Army Special Operations Forces (ARSOF) should differ from that of their General Purpose Forces counterparts and identifies the expected ARSOF mission set for the next twenty years as well as the professional competencies required to execute this expected mission set. It then offers a series of suggestions for how the recommended changes could be implemented.

Krause, K.J. (2010). *An analysis of first duty station placement and new graduate transition education and retention in the Navy Nurse Corps.* Retrieved from http://hdl.handle.net/10945/5408

This thesis examines the association between initial duty station assignment and retention of Nurse Corps officers. The main hypothesis of the thesis is that due to the increased clinical opportunities, higher patient acuity and larger patient census in major medical centers, Nurse Corps officers receive to more education and training prospects, which makes them more clinically prepared with higher job satisfaction. In nursing research, clinical preparedness and job satisfaction are both linked positively with retention. Using qualitative techniques to analyze the professional nursing literature and interview with military and civilian hospital administrators, comparing and contrasting Nurse Intern Programs at three Navy major medical centers, two Navy mid-level hospitals and four civilian facilities, and the quantitative technique of a multivariate model to analyze cohort data for new nurse accessions from 1994-1998, the author compares Nurse Intern Programs and isolates the effect of Military Treatment Facility assignment on retention. The results indicate there is no Navy-wide standardized education program for new nurses, potentially negatively affecting overall medical readiness, and that assignment at a major Military Treatment Facility is not a statistically significant predictor of retention. Further analysis of Nurse Intern programs is necessary to establish the effectiveness of the programs.

Chae, C.K. (2008). *The effect of graduate education on promotion of U.S. Army field grade officer by career field.* Retrieved from http://hdl.handle.net/10945/4298

The purpose of this study is to estimate the effect of graduate education on the promotion of

a U.S. Army field grade officer. In addition, this thesis investigates whether or not there are significant differences among career fields of the Officers Personnel Management System. To do so, a probit model and three correction models are built. The first correction model uses the Heckit method to correct for sample selection bias. The second model uses the instrumental variable regression method to correct for endogeneity of graduate education. The third model uses the double selection approach that combines the Heckit correction with two stage least squares to correct for both sample selection bias and endogeneity. The probit estimations indicate that the effect of graduate education for a representative officer increase the promotion probabilities by 0.148 and 0.132 for the grades of Lieutenant Colonel and Colonel, respectively. After correcting for sample selection bias, the effect of graduate education on the promotion to Lieutenant Colonel is reduced by 59.5 percent. After correction for endogeneity, this effect is increased by 70.9 percent. Finally, this effect increases by 61.5 percent after correction for both sample selection bias and endogeneity.

Styskal, M.S. (2008). *An assessment of the educational and training needs of a Marine Naval Academy graduate.* Retrieved from http://hdl.handle.net/10945/4018

The purpose of this research was to identify the educational and training needs for a Second Lieutenant from the Naval Academy entering the Marine Corps. This research is a needs assessment that identifies knowledge, skills, abilities and attitudes (KSAAs) that Naval Academy graduates need to be successful at The Basic School in Quantico Virginia. The research reviewed the current Naval Academy leadership curriculum, Marine Corps accession programs, training requirements and Marine-specific training programs at the Academy. Secondly, the research reviewed past studies of USNA graduates' performance in

the Marine Corps to determine if there were performance deficiencies to be addressed. Next, the research reviewed literature on needs assessments, education and training, KSAAs and a study on leadership development in the Marine Corps. This review was performed as background information as it pertained to the NL404 course. The methodology of this research was based on a needs assessment model that reviewed an existing course to determine if updates were needed. Surveys, interviews and document analysis were used to gather data to determine the needs of the Second Lieutenant. A total of 153 Class of 2005 Marine graduates and members of the TBS staff were surveyed and interviewed for the data collection. The data was analyzed using descriptive statistics and a comparison of means. Additionally, a content review of the interviews and document was used to ascertain the needs of the Second Lieutenant. Lastly, the data was summarized and recommendations were given concerning the content of the NL404 course.

Donovan, T.A. (2007). *Structuring naval special warfare junior officer professional military education*. Retrieved from http://hdl.handle.net/10945/3185

Naval Special Warfare does not currently have a designated career path for an officer that requires professional military education (PME) for SEAL junior officers after the rank of Ensign (O-1) and before the rank of Lieutenant Commander (O-4). There currently is interest in this subject matter at the Naval Special Warfare Command and Center. SEAL officers increasingly hold key leadership positions and influence critical decisions in the execution of national strategy. This growing responsibility calls for a progressive and sequential education program to prepare junior officers for battle, staff, and command. Additionally, the Naval Special Warfare Officer corps will continue to grow in the coming

years, adding more junior officers to the community. SEAL junior officers would benefit from structured PME throughout their careers. Through research analysis and a survey of Naval Special Warfare officers this thesis attempts to determine what education is critical for a SEAL junior officer. Additionally, this thesis attempts to determine the most efficient way to address education shortfalls and the frequency in which education should be experienced. Finally, the Naval Special Warfare junior officer community will benefit from education opportunities inserted into the officer career path to address nineteen specific subjects indicated in this research.

Hart, B.M. (2007). *An analysis of the Navy's voluntary education*. Retrieved from http://hdl.handle.net/10945/3599

The Department of Defense funds advanced education through the Voluntary Education Program. This study explores the following questions: (1) What is the economic return on the Navy's Voluntary Education Program (VOLED), especially Tuition Assistance (TA)? (2) What is the impact of TA on a sailors' career? and (3) What does a review of the literature indicate about the effects of the VOLED program? Some of the potential benefits of VOLED on sailors include improving their ability to cross-rate, improving their chances of advancement in their current rating, lowering their demotion rates and, possibly, improving reenlistment. Higher retention benefits the Navy by reducing the replacement costs for new recruits. While there is debate about the impact of VOLED on retention, the VOLED program is a service that is actively sought out by sailors, which suggests that it improves sailor satisfaction with the Navy The study concludes that additional funding should be given to the VOLED program based on the potential benefits to the Navy and the

likely increase of usage in the future. A study should be commissioned in the Navy to statistically assess the quantifiable effects of the Navy's VOLED program.

Kahraman, K. (2007). *The effect of advanced education on the retention and promotion of army officers*. Retrieved from http://hdl.handle.net/10945/3588

This thesis examines the relationship between advanced education and the retention and promotion of Army officers. It uses data from the Active Duty Military Master File for Army officers who were commissioned between 1981 and 2001 and tracked until 2004, or until they separated from active duty. Results of survival analysis indicate that survival functions differ significantly with level of education, and that advanced education has a positive effect on both the retention and promotion of Army officers. Compared to an officer with a baccalaureate degree, the survival time of an officer with a master's degree, a doctorate degree, or a professional degree is greater by 29.1 percent, 23.9 percent or 8.2 percent, respectively. An officer with a master's degree, a doctorate degree, or a professional degree has a hazard of leaving the Army that is 38.3 percent, 44.4 percent, or 75.6 percent, respectively, of that of a college graduate. Compared to an officer with a baccalaureate degree, the length of time to promotion to O-4 for an officer with a master's/doctorate degree or a professional degree is 0.2 percent shorter or 2.4 percent shorter, respectively. An officer with a master's degree or doctorate degree has a hazard of promotion that is 115.3 percent of that of an officer with a college degree. Having a professional degree has no significant effect on the hazard of promotion.

Landers, C.S. (2007). *Army Junior Officer education an assessment of institutional learning.* Retrieved from http://hdl.handle.net/10945/3103

As the Army continues its transformation into a more lethal and responsive force, in the midst of the War on Terror, it becomes increasingly important to make qualitative and critical assessments of our progress. One of the most important aspects of that transformation is how we educate the leaders of tomorrow. Are we providing the quality institutional education that will allow these new officers to meet the challenges of modern warfighting in the contemporary operating environment? The developmental education systems of the United States Military Academy and the Reserve Officer's Training Corps are designed to provide the foundational knowledge, skills and attributes to ensure success in combat and continued, lifelong learning. In this regard, both systems are marked with much improvement over the past several years. In fact, today's graduates are more capable and informed than any of their predecessors. Despite the improvements, daunting challenges remain for both systems, though they differ in nature and solution. The physical transformation of our Army is continuous and so too must be the mental transformation. Without improved focus on leadership, adaptability and the skills of the Pentathlete leader, our young officers face the prospect of fighting wars for which they are physically, but not yet mentally, prepared.

Magoula, A. & Myers, C.S. (2007). *Cost in higher education.* Retrieved from http://hdl.handle.net/10945/10222

State and Federal legislature require that standard data on education-related expenditures be provided by universities and colleges in order to standardize methodology and

accountability used nationwide by institutions of higher education. The aim is to review existing cost criteria and procedures for determining costs. Accounting structures vary by institution, and by school. This variability across schools makes decision making a difficult task. The objective of this research is to look into the cost structure used presently by two institutions of higher education, namely the Naval Postgraduate School (NPS) and California State University of Monterey Bay (CSUMB). The financial data that determines the consistency of the cost metrics in the decision making process of these institutions is considered. An analysis of the cost information used to make and support decisions is presented. The variety of the cost structures within the researched institutions is analyzed and compared, in order to identify the factors that generate the differences. The research concluded that both institutions should continue to develop the cost structure to have a comparative view across schools for more efficient planning and the tracing and updating of estimates.

Pearson, J.P. (2007). *The effect of graduate education on the performance of Air Force officers*. Retrieved from http://hdl.handle.net/10945/3621

This thesis investigates the effects of graduate education on the retention and promotion of Line of the Air Force (LAF) officers at the rank of Captain and Major. Logistic regression models are estimated to examine the effects of graduate education on the retention of Captains and Majors and on promotion to Major using data from the Active Duty Military Master File for fiscal years 1992 through 2006. A difference-in-difference estimator is incorporated into the promotion model to evaluate the effects of an Air Force policy change intended to eliminate any bias towards advanced education at promotion boards. Besides

graduate education, explanatory variables include basic demographic traits and professional characteristics. Results indicate that graduate education has a positive effect on retention of LAF officers at the rank of Captain and Major. Findings from the promotion model indicate that graduate education also has a positive effect on promotion but results for the change in policy (masking education information for promotion) are inconclusive. In addition, race and career field are shown to influence both retention behavior and promotion while gender significantly affects retention but not promotion.

Zardeskas, E.F. (2007). *Voluntary education of enlisted service members an analysis of program effects on retention and other outcome measures.* Retrieved from http://hdl.handle.net/10945/3336

This thesis analyzes the Navy's Tuition Assistance (TA) program. The thesis focuses on the effect of participation in TA on reenlistment and promotion outcomes for enlisted personnel. The statistical analysis is performed using data from: (1) Defense Manpower Data Center enlisted personnel files for cohorts Fiscal Years (FY) 1991-2001; (2) Military Entrance Processing Command accession information on those same cohorts; (3) and TA usage data from FY95-FY01 from the Navy Center for Personal and Professional Development. The analysis finds that sailors who use TA have a higher probability of reenlistment and promotion than those who do not. The successful completion of at least one college course results in even higher probabilities of reenlistment and promotion. These findings confirm the positive relationship between investment in human capital and reenlistment (i.e., retention) found in two previous military and one civilian study. The thesis recommends that

future research on this topic include data sufficient to adjust for potential selection bias in the statistical estimates.

Navarro, M.V. (2006). A retention analysis of United States Naval Academy immediate graduate education participants. Retrieved from http://hdl.handle.net/10945/2982

This thesis studied the retention of United States Naval Academy Voluntary Graduate Education Program (VGEP) and Scholarship participants in graduating classes of 1983-1998. The comparison group of nonparticipants consisted of USNA graduating classes 1983-1998 with an Academic Quality Point Rating (AQPR) comparable to the early graduate education students. AQPR was used in order to make the academic backgrounds similar for the participants and non-participants. The retention behavior of program participants and nonparticipants was compared to determine if participation in early graduate education affected retention. The models analyzed retention to each year of service between six and twelve years. In the retention models for unrestricted line officers, both VGEP and Scholarship had a small positive effect on retention to 7 YCS. Although the adjusted differences in retention are not large in magnitude, the results dispel the notion that early graduate education programs are used as vehicles by junior officers to facilitate transition to the civilian labor market following expiration of their initial service obligation. No changes to the service obligations for these programs were recommended.

O'Sullivan, L.M. (2006). *Measuring the value of graduate manpower systems analysis education for Naval officers.* Retrieved from http://hdl.handle.net/10945/2809

This thesis examines methods to assess the value of the Manpower Systems Analysis

(MSA) Curriculum at the Naval Postgraduate School. What exactly does the Navy get in return from the MSA curriculum graduates? Is the return on investment simply an increase in Quality of Life, thus increasing retention? Or does the MSA curriculum teach graduates the necessary skills for follow-on billets? Individuals in the private and public sections have tried to quantify the value of both training and education. However, currently most measures of effectiveness are based purely on financial aspects of the education. Little has been done to capture the result of the investments in human capital on any part of the organization. The result of this research is the creation of two surveys that will be used as vehicles to access the value of the MSA curriculum to the Navy and to the graduate. The surveys created are for MSA graduates and their immediate supervisors. This research identifies specific measures and survey techniques that can be used to evaluate education and training. In the future, this approach can be applied to other curricula.

Gray, Obra L. (2005). *Supply and demand for business education in naval aviation.* Retrieved from http://hdl.handle.net/10945/10032

In light of the Navy's transformation plan, advanced business education is increasing in importance. As part of the Navy's Sea Power 21 strategy, Sea Enterprise encourages Naval Aviation to steer historical management practices towards better business practices. As pilots and Naval Flight Officers evolve from Mission Commander to Commanding Officer, they must be equipped with requisite business skill sets to engage the challenge of balancing aircraft modernization with current readiness. This project analyzes the supply and demand for postgraduate business education to determine how prepared Naval Aviation is to achieve long-term transformation objectives. The results show that 25 percent of all aviation officers

(O-1 to O- 6) have a graduate business degree; 17 percent of Commanding Officers with advanced degrees have a business specialization; and 2.5 percent of aviation officer billets require a postgraduate business degree. Recommendations to better prepare the aviation community for the Sea Enterprise environment include: (1) Early emphasis of graduate business education, (2) Promote advanced business education as a major career milestone, (3) Tie first shore tour assignments to graduate business education, and (4) Increase the overall billet requirement for advanced business degrees. These improvements may greatly enhance the Navy's efforts towards achieving its transformation goals.

Kennedy, P.S. & McClure, J.T. (2005). *Performance-based service acquisition (PBSA) study and graduate level course material.* Retrieved from http://hdl.handle.net/10945/9985

The purpose of this project is to provide materials and information in the form of lessons that will make up a teachable course for graduate students of the Naval Post Graduate School. In addition, this research will address the current Department of Defense contracting policy, guidance, regulations and lessons learn. Performance-based Service Acquisition (PBSA) within the Department of Defense at both other government agencies, as well as commercial practices at progressive businesses are examined as they relate to PBSA. It is important to understand that the PBSA contract form involves acquisition strategies, methods, and techniques that define and communicate measurable performance expectations in terms of outcomes or results as opposed to directing performance methods, processes, systems or broad categories of work activity. To the maximum extent possible, the process should describe the work objectives in terms of what is to be the required output rather than how the work is to be accomplished and placing the responsibility for that accomplishment

on the contractor. This document contains best practices that have proven useful for drafting statements of work, solicitations, and quality assurance plans, and in awarding and administering performance-based service acquisitions. This document is not intended to be mandatory regulatory guidance, such manuals already exist, but rather assistance to agencies and students in implementing performance-based service acquisition more fully throughout DOD.

Hoffmann, A.J, Jr. (2004). *An analysis of the impact of changes in the officer education system on the Army's transient, holdee, and student account.* Retrieved from http://hdl.handle.net/10945/1571

The United States Army is making changes in the Officer Education System for 2nd lieutenants to majors. These changes affect the size of Transient, Holdee and Student account (THS). The current Officer Basic Course changes to a two-phased system called Basic Officer Leadership Course (BOLC II and III). A twenty-week Captains' Career Course (CCC) replaces the current CCC and Combined Arms and Service Staff School (CAS3). Currently, Command and General Staff College (CGSC), where 50% of a year group attends resident CGSC, shifts to a two-phased approach with a Common Core Course and a Career Field Qualification Course. This thesis includes an Excel simulation model producing monthly predictions for six years for officers in THS account because of schooling. Assignments are Permanent Change of Station (PCS), Temporary Duty (TDY) Enroute, or TDY and Return. Therefore, if 30% of majors attend Officer Education System (OES) as a PCS or TDY Enroute, the THS account sees a man-year increase of between 166 and 552 personnel. For CCC, if 30% of captains attend CCC as PCS/TDY Enroute, THS

shows a man-year decrease of between 1162 and 1171. When the new BOLC education system was simulated, the THS account showed a man-year increase of between 172 and 242 when compared to the current OBC.

Mishoe, R.M. (2004). *A survey on training and education requirements of Marine Corps Aviation Logistics Officers in preparation for sea basing.* Retrieved from http://hdl.handle.net/10945/1378

Sea Basing is a component of Naval transformation that changes the way Marine Corps forces deploy, fight, and are supplied. We consider the implications of Sea Basing for Marine aviation logistics officers, who have depended on a network of land-based systems to support Marine units engaged in military operations. Marine aviation logisticians are faced with the challenge of supporting Marine forces from the sea, and at distances much greater than before. We describe the results of a statistical survey that we conducted of the four military occupational specialties that comprise the Marine aviation logistics community: supply, maintenance, avionics, and ordnance. Our survey, which reached nearly 44 percent of aviation logistics officers, asked respondents to rate the importance of different types of training to help prepare them for Sea Basing. We find that Marine aviation logistics officers highly rate training in acquisition, advanced specialty training, and joint training. Officers rate the importance of training in these areas differently depending on the specialty of the officer. In addition, many officers regard training in supply-chain management as important to making a successful transition to a Sea Base.

Kabalar, H. (2003). Multivariate analysis of the effect of graduate education on promotion to Army Lieutenant Colonel. Retrieved from http://hdl.handle.net/10945/966

The objective of this thesis is to estimate and explain the effects of graduate education and other factors on promotion to the rank of Lieutenant Colonel (O-5) in the US Army. Our focus was primarily on determining whether graduate education provides officers with higher promotion probabilities. Besides graduate education, data that were analyzed include basic demographic traits, the officers' prior enlisted status, and their commissioning source information. The data used in this study were taken from the Active Duty Military Master File for fiscal years 1981 through 2001. This study develops multivariate logit regression and classification tree models to examine and explore the structure of the data sets. Both the regression models and the classification trees yielded positive results for the effect of graduate education on promotion. According to the regression model results, the odds ratio associated with graduate education is between 1.79 and 2.25. Military Academy and ROTC/Scholarship graduates have higher promotion probabilities than those from other sources, and married officers have higher rates than single officers. Additionally, age has a negative effect on promotion; that is, promotion probability decreases with age. Prior enlisted status, number of dependents, gender, race, and DOD primary occupation code do not seem to have statistically significant effects on promotion.

Milner, C.G. (2003). *A cost-benefit analysis of early graduate education programs for U.S. Naval Academy graduates*. Retrieved from http://hdl.handle.net/10945/6166

This thesis examined the effects of participation in early graduate education programs on retention among 1988-1996 USNA graduates. The comparison group of nonparticipants

consisted of USNA graduates in the top 200 on the Order of Merit in order to make the academic background similar to participants. The retention behavior of program participants and non-participants was compared to determine if granting early graduate education had an effect on retention to six years of service (one year beyond the minimum required service). For a pooled sample of all graduates, both the Voluntary Graduate Education Program (VGEP) and Scholarship program had positive effects on retention. The cost-benefit analysis found positive net benefits for VGEP, but a net-loss for the Scholarship program. However, while the analysis includes all costs, it omits some of the non-quantifiable benefits of the programs. If these benefits were quantified and included, it is expected that both programs would yield positive net benefits. Minor changes to the additional service requirements for both programs were recommended.

Vargas Davila, F. (2003). Determining the number of officers to graduate from the Naval School and the number of Naval School graduated officers to promote by rank in order to meet actual and future needs of the Mexican Navy. Retrieved from http://hdl.handle.net/10945/889

The Mexican Navy is challenged with too few O-1 to O-3 officers and too many O-6 to O-9 officers. This research developed three models to explain the challenge. Through the use of a transition probabilities matrix, model one predicts the number of graduates from the Mexican Naval School based on accessions. Model two is a transition probability matrix that uses model one's output to forecast the distribution of Naval School Graduate Officers (NSGO) by grade over the next ten years. Model three is a non-linear objective function that observes gaps between expected inventory and demand of NSGO over the same period. For

minimizing these gaps, this model considers three alternatives. The first alternative changes some transition probabilities of the second matrix while maintaining constant the probabilities of leaving ("out" probabilities) the MN and the probability of graduating from the Naval School (NS). The second alternative also changes some "out" probabilities and maintains constant the last probability. The last alternative also changes the probability of graduating from the NS. This research provides a method to determine the number of graduates from the NS and the numbers of promotions by grade to meet expected demands for NSGO personnel in the future.

Zaleski, P.J. (2003). *An assessment of the leadership education and development program at the United States Naval Academy.* Retrieved from http://hdl.handle.net/10945/883

Company officers at the United States Naval Academy are responsible for the leadership development of midshipmen. To attract higher quality officers to serve as company officers for the Brigade of Midshipmen and to provide officers with an opportunity for an advanced degree, the Leadership Education and Development (LEAD) Program was established in 1997. This program allows Navy and Marine Corps officers to receive a Master of Science in Leadership and Human Resource Development from the Naval Postgraduate School. After the first year, the program graduates serve two years as company officers and work closely with the midshipmen of the brigade. This research uses data obtained from semi-structured interviews and self-administered questionnaires of 27 LEAD program graduates. It focuses on the perceptions of graduates concerning the perceived strengths and weaknesses of the program, and makes recommendations for change and improvement. This research adds to the body of knowledge and recommendations that exist and serves as a

five-year retrospective on the perceptions of the effectiveness of the program and whether or not the program is perceived to be meeting its goals.

Zamarripa, L.R. & Lianez, R. (2003). *The effects of U.S. Marine Corps officer graduate education programs on officer performance : a comparative analysis of professional military education and graduate education.* Retrieved from http://hdl.handle.net/10945/1092

This thesis compares the effects of Marine Corps graduate education programs, categorized as either Professional Military Education (PME) or Non-PME, on officer performance. The intent of the thesis is to provide empirical evidence to support or refute Marine Corps cultural perceptions that PME improves officer performance more than Non-PME graduate education. A performance index (PI) is derived from the current Marine Corps fitness report system and averaged before and after graduate education for PME and Non-PME graduates and for a group of officers without graduate education (NOS). Data from the Marine Corps Total Force Data Warehouse are used to assess the marginal effect of graduate education in models that also included demographic, affective and cognitive traits. ANOVA results for O4s show significant improvement in performance over time for all groups (PME, Non-PME and NOS), with the largest improvement for PME and the smallest for NOS, although differences between groups are not significant. Multivariate regressions indicate that, after accounting for other influences, the post-education performance of those with graduate education is not significantly different from those without (NOS). The change in performance between before and after receiving graduate education is not significantly different for PME and NOS, while it is slightly lower for Non-PME than for NOS (significant at .10 level). A limitation of the study is that the data only covered four years of

fitness reports. Thus, we were not able to assess the long-run effects of graduate education on officer performance.

Branstetter, T.L. (2002). *Measuring the value of graduate information technology education for Marine Officers: a proof of concept study.* Retrieved from http://hdl.handle.net/10945/4247

This research examines a process to estimate the value of graduate education. Moreover, it demonstrates an approach to measuring the use of graduate education within organizations. Marine Corps officers who graduated from the Naval Postgraduate School's Information System Technology curriculum are studied. The study used a web-based survey for data collection and a Knowledge Value Added method to objectively estimate the value of education topics across different Marine Corps processes. Results indicate that the Information System Technology curriculum is designed and implemented to successfully meet sponsor requirements. It reveals that the education is highly valued and frequently used in post-graduation billets. The most valued aspect of the education is theoretical knowledge. However, the research showed how practical information technology skills and social relationships that developed during the resident education were also highly valued and frequently used. The results go on to show that personal interest in education topics often corresponded to greater perceived value. Lastly, a proof of concept demonstrates a method to measure and compare the use on graduate education in subsequent organizational processes. The Knowledge Value Added method provides the ability to compare education use between different topics, across different jobs, and between different people.

Celik, G. (2002). *An Analysis of the effect of graduate education on the job performance of federal (DoD) civilian employees.* Retrieved from http://hdl.handle.net/10945/6086

The main purpose of this study is to examine the relationship between graduate education and the job performance of DoD civilian employees. The thesis focuses on selected job performance measures for all civilian DoD personnel employed between 1986 and 1999, except for those in the National Imagery and Mapping Agency and direct and indirect hire civilian employees outside the 50 states and the District of Columbia. The Defense Manpower Data Center (DMDC) provided the personnel data. Performance measures that are analyzed include promotion, promotion speed, performance ratings, earnings and retention. Three different techniques are used to estimate performance models. First, ordinary least squares is used to estimate the salary and performance rating models. Second, binary logit regression is used to estimate promotion, retention, and performance rating models. Third, survival analysis using Cox Regression estimates the speed of promotion and the time to separation. The results indicate that employees with a Master's or Doctorate earned more in average salary but experienced lower salary growth than employees with a Bachelor's degree. Also advanced degree holders are promoted more slowly since they enter at a higher GS grade. Higher educated employees were also more likely to leave federal service, but were more likely to receive top ratings and achieve a supervisor position.

Page, C.L., Miller, S. H (2002). *A comparative analysis of leadership skills development in Marine Corps training and education programs.* Retrieved from http://hdl.handle.net/10945/3482

This thesis analyzes the perceptions of a non-random sample of 210 officers and enlisted Marines in two locations. A researcher-developed survey and semi-structured interviews

were administered to ascertain opinions of Marines concerning leadership development. An analysis of the content of leadership training and education courses was also conducted. This information was compared to contemporary leadership theory and relevant models of leadership. In general, leadership development provided is adequate, but is lacking in some areas of skill development, application of skills and values, and relevancy to contemporary leadership issues. Professional Military Education (PME) generally provides relevant leadership training and education to enlisted personnel, but falls short of meeting the expectations of many officers.

Branigan, G.A. (2001). *The effect of graduate education on the retention and promotion of Marine Corps officers.* Retrieved from http://hdl.handle.net/10945/10846

This thesis analyzes the factors associated with retention to the 0-5 promotion point and selection for promotion to 0-5. In particular, this thesis focuses on the economic returns to graduate education and specifically Naval Postgraduate School (NPS) education. In theory, the payoff to the Marine Corps is the increased productivity of the officer with a graduate degree. This thesis analyzes the differences in retention and promotion rates between officers with and without graduate degrees. Data from the FY1998 through FY2001 lieutenant colonel promotion boards and data for the corresponding accession cohorts, who entered the Marine Corps between FY1980 and FY1984 are merged with Automated Fitness Report System (AFRS) data. Nonparametric analysis and simple Probit techniques are used to estimate retention and promotion models. The results suggest that, in addition to other factors, graduate degrees from NPS and from sources other than NPS both have a positive effect on the retention and promotion of Marine officers. Several statistical techniques are

applied to correct for potential biases due to self-selection and sample selection. However, results from these techniques prove sensitive to slight changes in model specification and therefore, are not conclusive.

Senn, D. (2001). *Space training and education for USN cryptologic officers - the road to space certification.* Retrieved from http://hdl.handle.net/10945/3160

This thesis discusses the importance of space-related education and training for Naval cryptologic officers in their efforts to support the warfighter. It includes a discussion of the learning continuum concept, an outline of cryptologic officers' career milestones for space-related training, and a discussion of the Navy's Distributed Learning initiatives. This thesis provides a framework for the establishment of a Space Certification Program for Naval cryptologists. The proposed Space Certification model was designed to allow expansion of the program to include Naval officers in other communities.

Phillips, W. B. (2001). *The impacts of a fully funded Postgraduate Education on promotion and command screen for fixed-wing, carrier-based pilots and Naval Flight Officers*. Retrieved from http://hdl.handle.net/10945/10863

This thesis evaluates the effect of fully-funded graduate education on the joint outcome of promote to Pay Grade 5 and screen for squadron command for fixed-wing, carrier-based aviator lieutenant commanders (Pay Grade 4) eligible for the Pay Grade 5 board. Binomial logit models are estimated to examine the impacts of earning a graduate degree, the timing of the degree, and the technical specificity of the degree. The thesis finds no evidence that career progression at this critical point is harmed by acquiring a fully-funded graduate

degree. Rather, the thesis finds significant positive effects on promote/screen for those officers earning advanced degrees at selected junctures. Logit model estimates show that aviators with fully-funded technical degrees earned one or more years after the Pay Grade 4 board are 26.9% more likely to promote/screen than aviators without graduate degrees. Additionally, officers who earned graduate degrees on their own time are 5.8% more likely to promote/screen than officers without graduate degrees.

Bok, M.J. (1999). *Addressing the United States Navy need for software engineering education*. Retrieved from http://hdl.handle.net/10945/13661

Computer technology use as a highly effective tool is ever increasing in the modem world, including the warfare arena. Manning issues due to budget concerns mandate a smaller future military workforce, while theater conflicts will continually grow in complexity. Computers are powerful tools that can aid the warrior's ability to fight amidst this onslaught of information. Unfortunately, a computer cannot simply be dropped onto a ship to create miracles on its own. Computers are only as intelligent and useful as they are engineered to be. The costs of this highly difficult and expensive task can be mitigated by proper utilization of personnel specifically educated to plan and produce these systems and the associated software. The Navy can produce these personnel from within its ranks, via a curriculum in Software Engineering at the Naval Postgraduate School; however the effectiveness of this program is not currently being maximized. This thesis develops and implements a program to address the Navy's needs for software engineering, helping successfully combat the Navy's current void in software engineering education. This should

ultimately lead to an increase in the Navy's knowledge assets, and subsequently to better opportunities for Naval utilization of the technology available to improve warfare abilities.

Conzen, E.L. (1999). *An analysis of the impact of fully funded graduate education on the retention of Naval officers*. Retrieved from http://hdl.handle.net/10945/13422

This thesis investigates the impact of "funded graduate education" on retention of Naval Officers. Logit regression and multivariate models were used to determine the effects that a graduate degree from the Naval Postgraduate School (fully funded) or civilian graduate schools through partially funded graduate programs had on officer retention. The data sets were created using data from the Officer Master Record Files (OMRF) obtained from the Defense Manpower Data Center, Monterey, California (DMDC). The data sets included all Naval Officers that were eligible for voluntary separation each year from 1992 to 1997. Maximum likelihood logit regression was used to estimate the probabilities that officers with graduate degrees earned from NPS or civilian institutions decide to leave the service at the end of any mandatory educational obligation. The findings revealed indicate that although funded graduate education may have an effect on promotion possibilities, its impact on retention past the ten-year point in an officer's career is not detectable.

Johnson, L.V. & Sanders, M.F. (1999). *Redesign of the advanced education processes in the United States Coast Guard*. Retrieved from http://hdl.handle.net/10945/13689

The processes used in the operation of the Coast Guard Advanced Education Program have evolved as most business processes that were developed prior to the introduction of information technology. These processes include the selection, management, assignment

and tracking of advanced education students. These processes are still fully dependent on physical files and the mail system. The Coast Guard has an information technology infrastructure that supports better processes, however it is not being utilized in an integrated fashion. The objective of this thesis is to document the present processes and apply Business Process Reengineering techniques to identify avenues of change to improve critical measures of performance. Key findings include the lack of critical performance measures, present system billet and officer codes do not identify job billets that require advanced education or personnel with advanced education, and electronic submission of information could reduce cycle time and facilitate decision making in these processes.

Michael, J.C. (1999). *The effect of a military family background on midshipmen performance at the United States Naval Academy and USNA Graduate performance in the Fleet.* Retrieved from http://hdl.handle.net/10945/13630

This research analyzes USNA and fleet performance of midshipmen who come from career military family backgrounds. It is hypothesized that a military family background provides children with values that help them succeed at the Academy and in the Fleet. This thesis uses USNA classes of 1988 - 1992 to judge performance at the Academy and USNA classes of 1980 - 1985 to measure fleet performance. Performance was measured in terms of graduation rates, attrition rates and final aggregate multiples. In judging officer performance, retention rates to the LCDR boards and career promotion rates to LCDR and CDR were examined. Results suggest that a military family background may be significant in determining success at the Academy and in the Fleet. However, more research is necessary to adequately isolate the effect of a military family background.

Usan, A. & Utoglu, M. (1999). *The effect of graduate education on the job performance of civilian departments of defense employees.* Retrieved from http://hdl.handle.net/10945/13730

The purpose of this thesis is to investigate the effects of graduate education on the job performance of Department of Defense (DoD) civilian employees. The data used in this thesis were drawn from the Department of Defense Civilian Personnel Data File, which was provided by the Defense Manpower Data Center. The raw data were restricted to employees who possess at least a Bachelor's degree and are paid under General Schedule (GS) or General Management (GM) pay systems. Four performance measures were developed to investigate the effect of graduate education on job performance: salary level, promotion, retention, and performance rating. Four multivariate models were constructed for these performance measures. Ordinary least square (OLS) techniques were used to estimate the salary model. Logistic regression was used to estimate the promotion, retention, and performance rating models. The results found that the effect of having a Master's degree was positive in the salary, promotion, and performance ratings models. The effect of a Master's was negative in the retention model. All these findings were consistent with basic human capital investment theory. The thesis recommends that future research develop alternative job performance indicators and focus on specific occupations and functional areas.

Calhoun, T.R. (1998). *Evaluating security assistance programs: performance evaluation and the Expanded International Military Education and Training (E-IMET) program.* Retrieved from http://hdl.handle.net/10945/8326

In 1991 the International Military Education and Training (IMET) program was expanded to include training programs focusing on civilian control over the military, respect for human

rights, and responsible defense resource management. In 1993 Congress institutionalized the federal government's commitment to performance measurement by signing into law the Government Performance and Results Act (GPRA). GPRA requires the Departments of State and Defense to demonstrate the results achieved by programs such as Expanded IMET (E-IMET). The purpose of this study is to address how the Defense Security Cooperation Agency (DSCA) can tackle the challenge of measuring the effectiveness of the E-IMET program. A spectrum of approaches exists to evaluate public programs and is anchored on one end by the "technically rational paradigm" and on the opposite end by the "politically rational paradigm." By organizing the security assistance objectives of key E-IMET stakeholders into a Global Hierarchy the researcher was able to link the E-IMET program to national level goals, creating an objective baseline from which to measure the performance of the program. Individual objectives hierarchies were then created for each E-IMET objective and performance indices were proposed to meet the requirements of the GPRA mandate

Lathroum, J.A. (1998). *A comparative analysis of graduate management education.* Retrieved from http://hdl.handle.net/10945/8106

This thesis analyzes the top ten Master's of Business Administration (MBA) programs and top ten Public Management programs in the United States and has established a definition of quality in graduate management education in terms of programs offered, students selected and faculty. The top ten MBA and Public Management programs were then compared to the Master of Science (MS) in Management offered at the Naval Postgraduate School (NPS). With these comparative data, basic similarities and differences are identified between NPS

and the selected programs. The structure of the MS in Management at NPS is similar to the MBA and Public Management curricula by requiring an extensive mission-related project (thesis), prior professional work experience and learning through a team based orientation. Keeping with its mission, the Department of Systems Management offers curricula that span programs from both MBA and Public Management. Because of this broader scope, the average length for the MS in Management at NPS is about two months longer than the average MBA and Public Management program. Additionally, the average total courses taken are the same as the average MBA program but six more than the average Public Management program. Students at NPS are selected based on academic and leadership ability instead of GMAT and GRE scores used at the selected schools. Finally, the faculty are a civilian and military mix who's goal is to produce quality graduates to fill subspecialty billets for the DoD.

Orzell, M.S. (1998). *The impact of fully-funded graduate education and resident JPME on aviator promotion and command selection.* Retrieved from http://hdl.handle.net/10945/8492

The purpose of this thesis is to examine the impact that FFGE and JPME have on aviator promotion to the ranks of Commander and Captain and on selection for command. This thesis accurately measures their impact by incorporating new measures of performance, namely good jobs. These two proxies for performance were developed to help capture those unmeasurable characteristics that do not show up on officer Fitness Reports. This study examines officers appearing before the 1988-1994 Commander and Captain promotion boards. Two separate Log it models are used to estimate the effects of these educational opportunities on promotion both before and after the start of the drawdown. Separate Logit

regression models for command screen are also specified for these two time periods. Model results indicate that FFGE had a significant positive impact on Commander selection and a significant negative impact on command selection in the pre-FY90 period. The impact of JPME was significant and positive for promotion to Commander in both periods and for command screen in the pre-FY90 period. Joint Duty Assignment had a significant and negative impact on command selection in both periods. The results of these models may reflect changes in the policies of the aviation community toward FFGE and JPME as well as differences in the officers who choose the educational opportunities. This thesis provides evidence of difficulties in combining FFGE, JPME and JDA in an aviation career

Spencer, J.E. (1997). *A comprehensive study of factors impacting the future size and scope of military graduate medical education.* Retrieved from http://hdl.handle.net/10945/25760

Graduate medical education (GME) is the postgraduate medical education required for all medical school graduates pursuing licensure. Since World War II, the military medical services have undertaken full time in service GME missions to ensure a supply of quality physicians and surgeons for both the military's wartime readiness and peacetime health benefit missions. However, determining the number of active duty physicians and surgeons, and the specialties which they practice, has been a complex and controversial issue within military medicine, particularly since the end of the Cold War. This thesis examines the factors impacting the future size and scope of military GME. A comprehensive history of military GME is provide Detailed events and issues impacting GME which surfaced following the Cold War are also discussed. The current Department of Defense GME policy and funding issues are examined, as well as the operational GME implementation model

developed by the United States Navy. This thesis found that GME has historically been a valuable tool for recruiting, training, and retaining quality physicians and surgeons. Post-Cold War budget constraints and readiness policies and private sector changes in GME are likely to force changes in military GME programs, decreasing both the number of doctors and specialties

Walsh, D.J. (1997). *Joint professional military education and its effects on the unrestricted line naval officer career.* Retrieved from http://hdl.handle.net/10945/8595

The results of this thesis show Joint Professional Military Education (JPME) has four primary impacts on the Unrestricted Line (URL) Naval officer career. First, JPME is an effective retention tool. Second, almost all URL officers completing WME do so between the 10 and 22 year points in their career. Third, a URL officer completing any form of JPME prior to the 0-5 promotion board does not have a significantly better chance of promoting to 0-5; whereas, a URL officer completing resident JPME prior to the 0-6 promotion board has a significantly better chance of promoting to 0-6- except in the case of nonresident WME, intermediate level Phase 1/11, and the equivalents (Federal Executive Fellowships or Foreign Service Colleges). For these three forms of JPME, the effect on promotion is insignificant at all levels. Fourth, unlike JPME, a URL officer completing any form of graduate education prior to the 0-5 promotion board has a significantly better chance of promoting to 0-5. In contrast, a URL officer completing graduate education after the 0-5 promotion board does not have a significantly better chance of promoting to 0-6

NPS FACULTY PUBLICATIONS

In progress: Thomas, G., Hatch, B. & Tick, S. *Returns to funded graduate education: A baseline capture for CIVINS and an examination of service obligation requirements*. Expected publication date March 2018.

Bacolod, M. and Chaudhary, L. (2017). Distance to promotion: Evidence from military graduate education. *Contemporary Economic Policy, forthcoming. DOI:* 10.1111/coep.12275. Retrieved from http://hdl.handle.net/10945/48651.

While a large literature has studied the effects of different education delivery modes on course grades and related education outcomes, we know much less about how these delivery modes impact subsequent job performance. Using a unique dataset of US military officers pursuing graduate education at the Naval Postgraduate School, we implement propensity score matching methods to identify the effects of distance education programs on academic and job outcomes such as promotion within the military and separation from the military. The distance education degree programs in our context share many common features with online programs that are growing in number by the day. We find a large and negative impact of attending distance education degree programs on average GPA, graduation, number of thesis extensions, promotion and separation from the military. That said, the average effects of distance education mask substantial heterogeneity by group. The negative effects are smaller among pilots and Hispanics compared to among junior military officers and individuals who earned their undergraduate degrees from public universities.

Lucas, T.W. (2017). Teaching O.R. at the NPS. *OR/MS Today*, 43(4). Retrieved from http://hdl.handle.net/10945/56199

At the Naval Postgraduate School, students learn O.R. by doing O.R. that helps enhance the security of the United States and its allies.

Brown, G.G., DeGrange W.C., Dell, R.F., & Fricker, Jr., R.D. (2015). ASP, art and science of practice: Educating military operations research practitioners. *Interfaces*, 45(2), pp. 175-186. Retrieved from http://hdl.handle.net/10945/44448

The 2013 UPS George D. Smith Prize was awarded to the Naval Postgraduate School's (NPS) Operations Research (OR) department for "effective and innovative preparation of students to be good practitioners of operations research, management science, or analytics." In the spirit of the prize, this paper shares details about our degree program. The program is closely linked to its military sponsor, the United States Department of Defense, in a unique relationship that ensures NPS students and faculty are focused on critical and important problems facing the military. Our students bring firsthand knowledge of the challenges our organization faces, and leave our academic program as OR practitioners prepared to immediately meet those challenges.

Fast, W. (2011). Factors influencing the effectiveness of systems engineering training and education in the Department of Defense. *Proceedings of the Eighth Annual Acquisition Research Symposium, Thursday Sessions, Volume II.* Retrieved from http://hdl.handle.net/10945/33675

While current systems engineering certification courses within the Department of Defense

appear to do a pretty good job of training and educating the workforce, improvements can be made. The use of more problem-based methods of learning would equip the students with better problem identification and reasoning skills needed to solve the complex problems they encounter on the job. Learning outcomes in some of these courses could be rewritten to target the analyze, evaluate, and create levels of Bloom's Taxonomy, thereby improving student critical thinking skills and ultimately improving far-transfer of learning to the job. Also, learning assessment methods in a few of the courses could be changed to focus more on the assessment of conceptual understanding, vice rote memorization, in order to promote deep learning. Recommendations are also presented for additional research into a more effective systems engineering andragogy.

Roberts, B. & and Owen, W. (2011). Orientation and engagement of systems engineering distance education students. In *EdMedia: World Conference on Educational Media and Technology (*pp. 552-557). Association for the Advancement of Computing in Education (AACE), 2011. Retrieved from http://hdl.handle.net/10945/56219

The Naval Postgraduate School (NPS) has been involved in distance education and learning since the mid 1950's. In the mid-90's, distance education programs exploded across the campus largely due to an expanding customer based fueled by the information technology revolution. From a strategic planning perspective, a big question for NPS was whether the traditional model for developing, managing and evaluating resident programs needed to change for distance education programs. Distance learning instructional modalities vary and the needs of distance education faculty and students may vary as well. In a recent accounting, NPS had a total student enrollment of 2,420 students. Of those students, 1,028

were non-resident. Of the non-resident students, about 77 % (792) are pursuing a degree. Considering student enrollment in all distance education programs at NPS, about 58 % are DoD civilians, while 42 % are military. In particular, in the last ten years, NPS has experienced asymptotic growth in its distance education programs. This has been especially noted in the area of systems engineering.

Owen, W. & Roberts, B. (2009). A case study of distance education at the Naval Postgraduate School. In *EdMedia: World Conference on Educational Media and Technology* (pp. 2654-2661). Association for the Advancement of Computing in Education (AACE). Retrieved from http://hdl.handle.net/10945/56200

This study investigates video Tele-education as an effective instructional delivery mode for three graduate degree programs at the Naval Postgraduate School (NPS) when faculty attitudes, student attitudes and administrative staff attitudes are measured. A quasi-experimental case study comparing two delivery methods, resident and Tele-education, was conducted. Data for student attitudes were obtained by archival student opinion forms used by NPS. Data for faculty and administrative staff attitudes were obtained from online surveys. Follow-up personal interviews were conducted as required to clarify respondent answers. Faculty, student and administrative staff attitudes were measured comparing instruction delivered by distance learning mode using video Tele-education and traditional mode using the standard resident classroom. Qualitative and quantitative methods were used for analysis. The case study provides NPS and other academic institutions valuable lessons to help build or improve their distance education programs.

Rendon, R., & Stevens, B. (2005). *Graduate education and research: Key to procurement transformation*. Contract Management, 45(39), 39-44. Retrieved from http://hdl.handle.net/10945/56402

Faced with the challenges of the global war on terrorism and the fiscal battles of budget cuts and resource constraints, the Department of Defense (DOD) continues to rely on its procurement process to ensure a continuous flow ow of critical supplies and services. In the fiscal year budget for 2005, the DOD proposed $143.8 billion for research, development, test, and evaluation (RDT&E), and for the procurement of defense-related supplies and services in support of the national military strategy. 1 As the DOD continues to acquire increasingly critical and complex supplies and services in such a turbulent environment, its reliance on a clear acquisition process will continue to increase in importance. The DOD's current process is undergoing a transformation similar to the commercial sector's, changing the way organizations manage their procurement function to include people, processes, practices, and policies. The procurement function is gaining enhanced status as leading organizations, including the DOD, understand and realize its importance in achieving organizational strategic objectives and securing a competitive advantage. In addition to the procurement process transformation, the DOD is also responding to this turbulent environment on another front—that of providing formal graduate level education to its military and civilian acquisition professionals, as well as conducting extensive research in the area of acquisition and contracting for DOD customers. This article will discuss how the DOD is leveraging its resources at the Graduate School of Business and Public Policy of the

Naval Postgraduate School (NPS) to transform military and civilian acquisition professionals.

Bowman, W.R. & Mehay, S.L. (2004). *Return on investment in Navy graduate education* [Powerpoint file]. Retrieved from http://hdl.handle.net/10945/25119

Analysis of costs and benefits of graduate alternatives and apply accepted economic principles to estimate monetary values of program benefits and costs using data on Surface Warfare Officers

Platzer, M.F., Bell, R.W., Schmidt, L.V. & Newberry, C.F. (2003). Naval officer graduate education in aerospace engineering at the Naval Postgraduate School. Retrieved from http://hdl.handle.net/10945/55365

Although the Naval Postgraduate School (NPS) was established in 1909 on the campus of the United States Naval Academy, the Department of Aeronautics was not established until 1947. The initial mission of the Department of Aeronautics was to better prepare naval aviation officers for the transition from piston engine powered aircraft to gas turbine powered jet aircraft. In 1987 the Department was expanded to include the field of astronautics. In this paper the educational objectives, programs, and developments in the major areas of concentration are briefly described for the purpose of providing a historical perspective on the Department's development, major accomplishments and current status.

Bowman, W.R., & Mehay, S.L. (2002). College quality and employee job performance: Evidence from naval officers. *ILR Review,* 55(4), 700-714. Retrieved from http://hdl.handle.net/10945/47727

This study analyzes the effects of college quality and individual academic background on selected job performance measures for officers working in professional and managerial jobs in the U.S. Navy. The study analyzes performance indicators at selected career points for cohorts in two occupational groups. Among staff personnel, who perform mostly administrative and support functions, the authors find that graduates of private schools, regardless of college quality, received better performance appraisals than did other officers. Among line personnel, who perform jobs on ships and submarines and in aviation, graduates of top-rated schools, both public and private, received better appraisals during the early career period. Within both occupational groups, graduates of top-rated private schools were more likely than other officers to be promoted at the up-or-out point. The results are consistent with prior studies that find an earnings premium attached to attendance at elite private colleges.

Schrady, D. (2001, February). Golden anniversary: Fifty years of graduate education in operations research at NPS produces 3,300 alumni worldwide. *ORMS Today*. Retrieved from http://hdl.handle.net/10945/50289

The year 2001 marks the 50th anniversary of the graduate education program in operations research at the Naval Postgraduate School in Monterey, Calif. It was no accident that the School should have begun its program so early. The U.S. Navy established the first formal operations research organization in this country in the spring of 1942 and relied on operations research throughout World War II. In 1950, the Chief of Naval Operations directed that a program of study in operations research be created. The program began in August of 1951 with a class of nine students, and the first degrees were awarded in January

1953. The curriculum has been offered continuously since its initiation. There are more than 3,300 alumni representing all of the U.S. military services and those of 31 other nations.

Bowman, W.R. and Mehay, S.L. (1999). Graduate education and employee performance: Evidence from military personnel. *Economics of Education Review* 18: 453-463. Retrieved from http://hdl.handle.net/10945/25479

Few studies have examined the relationship between on-the-job productivity and graduate education using single-firm data. This paper studies the effect of graduate education on job performance using a unique micro-database consisting of military officers. Supervisor ratings and promotion probabilities are examined for professional and technical officers in the US Navy, a hierarchical organization with an internal labor market and up-or-out promotion policies. Single stage estimates indicate that, among those eligible to be considered for promotion to grade 4, the up-or-out point, those with any graduate degree are more likely to be promoted. The effect is especially pronounced for those who receive a degree via the Navy's sponsored, full-time program. However, when instruments that are uncorrelated with promotion are used to predict graduate degree status, the results suggest that a sizeable portion of the relationship between graduate education and promotion is due to unobserved attributes that lead some people to attend (or to be selected for) graduate school and to be more promotable. The selection-corrected estimates of the promotion effect of graduate education are reduced by between 40 and 50%.

Gates, W. R., Maruyama, X. K., Powers, J. P., Rosenthal, R. E., & Cooper, A. W. M. (1998). *A bottom-up assessment of Navy flagship schools: The NPS faculty critique of CNA's report*.

Retrieved from http://hdl.handle.net/10945/25594

This report is a critique of the report from the Center for Naval Analysis (CNA) titled A Bottom-Up Assessment of Navy Flagship Schools. This critique identifies benefits of Naval Postgraduate School (NPS) programs that were overlooked in the CNA report including availability of government housing, year-round operation, rapid refresher, ability to efficiently transition officers to fields of study different than their undergraduate major, and higher course-loads. Cost analyses incorporating these benefits indicate that NPS is highly efficient at providing graduate education to naval officers at a low cost per student. Other ancillary advantages are identified including the military relevance of course materials and laboratory facilities, the professional military environment of NPS (including the presence of officers from all services and international officers), and the production of research products that are useful to the Navy.

SELECTIVE LIST OF RELEVANT NON-NPS AUTHORED PUBLICATIONS

Committee on Review of Specialized Degree-Granting Graduate Programs of the DoD in STEM and Management, Division on Engineering and Physical Sciences, National Research Council. (2014). *Review of specialized degree-granting graduate programs of the Department of Defense in STEM and management*. Washington, DC: National Academies Press. Retrieved from http://nap.edu/18752

"The United States military is arguably the most intensely technological, complex enterprise in existence. When compared to the gross domestic products of other countries, the Department of Defense (DoD) budget ranks above all but about 20 nations. If viewed as a

company, it would be the largest globally with the most employees. Major investments in weapons systems using advanced technologies provide an advantage over competing systems. Each weapon, platform, vehicle, and person in an operating force is a node in one or more advanced networks that provide the ability to rapidly form a coherent force from a large number of broadly distributed elements. DoD's ability to create and operate forces of this nature demands a competent understanding by its workforce of the composition, acquisition, and employment of its technology-enabled forces." Abstract retrieved from https://www.nap.edu/catalog/18752/.

McDonnell, J. (2013). Naval Postgraduate School: A sacred cow? *U.S. Naval Institute Proceedings*, 139(10), 60-64.

"The Naval Postgraduate School in Monterey, CA, has provided top-notch graduate education to military students for more than a century. It enjoys a strong reputation in academics and research, but a 2012 Inspector General report found the school had not adhered to several federal and Navy laws and regulations resulting in Secretary of the Navy Ray Mabus firing its president and provost. The school is growing by leaps and bounds, with enrollment increasing 46% in the ten-year period from 1996 to 2006. In addition, research-and-development expenditures increased 51% during the same period. The military is required to look at each of its activities and identify non-inherently governmental functions. An inherently governmental function is one that is so intimately related to the public interest as to require performance by Government employees. The Navy's six Maritime Strategy Core

Capabilities include forward deterrence, strategic deterrence, sea control, power projection, maritime security, and irregular warfare." (Abstract retrieved from ProQuest).

Naval Postgraduate School: A sacred cow? (2014). U.S. Naval Institute Proceedings, 140(1), 8-9, 84-85.

Naval Postgraduate School: A sacred cow? (2014). U.S. Naval Institute Proceedings, 140(2), 83-84.

Persyn, J. M., & Polson, C. J. (2012). Evolution and influence of military adult education. *New Directions for Adult and Continuing Education*, (136), 5-16. http://dx.doi.org/10.1002/ace.20031

"...reviews the historical relationship between adult education and the military and continuing efforts by the military to emphasize adult learning principles in training and education." (Abstract retrieved from the article)

Vasquez, M.D. (2012). *The graduate education of warrant officers by AMSP provides benefits to the Army*. Ft. Leavenworth, KS: Army Command and General Staff College School of Advanced Military Studies. Retrieved from http://www.dtic.mil/get-tr-doc/pdf?AD=ADA569940

"Warrant Officers are the Army's technical experts, and they provide commanders with detailed information in their area of expertise. The traditional Warrant Officer career path has been very narrow and focused. However, the Army has recently begun offering broadening opportunities to Warrant Officers, such as the Advanced Military Studies Program (AMSP). In 2010, the first group of Warrant Officers graduated from the AMSP

and moved on to assignments throughout the operational Army. The program transforms select officers into agile and adaptive leaders who are able to think creatively and critically and to develop viable options for commanders. This monograph examines the benefits that AMSP-educated Warrant Officers provide to the Army and answers the following question: Why does the Army Send Warrant officers to AMSP?" Abstract retrieved from Defense Technical Information Center, http://www.dtic.mil/docs/citations/ADA569940

New Directions for Adult and Continuing Education. (2012). Special Issue: Beyond Training: The Rise of Adult Education in the Military. 212(6), 1-98. http://dx.doi:10.1002/ace.v2012.136

Switzer, Tobias. (2011). Air Force policy for advanced education: Production of human capital or cheap signals? *Air and Space Power Journal*, (25),4, 29-42. Retrieved from http://www.dtic.mil/get-tr-doc/pdf?AD=ADA555781

"In the first decade of the twenty-first century, the US Air Force experienced a significant policy debate regarding officer education. The question at hand concerned why officers attain graduate-level education or advanced academic degrees (AAD) and how those achievements should affect promotions. On the one hand, some officers, such as those serving as researchers, political affairs officers, or academic instructors, need education above and beyond their undergraduate training because the level at which they work is more specific than general. On the other hand, it is not completely clear why the vast majority of Air Force officers, such as those serving on aircrews, in personnel and finance units, and so forth, need more education than necessary to conduct their work. This second group of officers, the generalists, represents the source of contention and debate. Moreover, this

controversy led to conflicting policies from the most senior leadership, leaving the issue muddled and confused for today's junior and field-grade officers. This article discusses the main points of each policy and interprets them through the lens of modern economic theory. Using the well-developed ideas of human capital and signaling, along with empirical evidence, it argues that advanced education has become not a means of increasing knowledge and ability so much as a proxy for officers commitment to their careers. The article extends this line of inquiry to nonresident professional military education (PME) programs, in which it finds much similarity. Finally, it offers a different vision, modeled on a sister service s program, that would make the education experience more valuable for both our officer corps and the Air Force by expanding opportunities at civilian universities in exchange for long post educational commitments." Abstract retrieved from Defense Technical Information Center, http://www.dtic.mil/docs/citations/ADA555781

Kamarck, K.N ., Thie, H.J, Adelson, M. & Krull, H. (2010) *Evaluating Navy's funded graduate education program: A return-on-investment framework.* Santa Monica, CA: RAND. Retrieved from http://www.dtic.mil/get-tr-doc/pdf?AD=ADA527776

"The U.S. Navy and the other military services send a number of their officers to graduate-level institutions each year to obtain advanced degrees. The primary purpose of providing these officers graduate education is so they can fill positions in their services whose duties require the knowledge and skills gained in graduate school. Furthermore, the benefits of a graduate education extend beyond the specific assignment for which the officer was educated, applying to subsequent assignments as well, albeit less directly. However, at an estimated cost of about $245,000 per officer for a funded master's degree, the cost of this

education is substantial. For fully funded education, the service must pay not only the cost of the education but also the pay and allowances associated with an officer's billet allocated for education. Additionally, an opportunity cost is incurred: While the officer is attending school, his or her services are lost to the operational billets in which he or she could be gaining experience. The question frequently arises as to whether the benefit gained from a graduate education is worth the cost. While the quantitative effects of graduate education can be estimated, evaluating the qualitative effects of a graduate education poses a number of challenges." Abstract retrieved from http://www.dtic.mil/docs/citations/ADA527776.

Graham, J. (2000). Rethinking the naval postgraduate school. *U.S. Naval Institute Proceedings*, 126(7), 46-49.

"Examines US Navy officer education at the NPS in Monterrey, California; argues that a public-private partnership would be cheaper, more efficient, and lead more officers to pursue graduate studies." Abstract retrieved from ProQuest.